WHAT IS CLAIMED IS;

1. A power transmission device including an input shaft and an output shaft, the power transmission device comprising:

a plurality of internally meshing planetary gear mechanisms, each including an external gear and an internal gear having external teeth and internal teeth a difference in a number of teeth between which is slight, the plurality of internally meshing planetary gear mechanisms serving as power-transmitting mechanisms in a path of power transmission of the power transmission device;

wherein at least two of the plurality of internally meshing planetary gear mechanisms are disposed in parallel on a path of power transmission and are different from each other in power transmission characteristics.

2. The power transmission device according to Claim 1, wherein factors of the mutually different power transmission characteristics of the two internally meshing planetary gear mechanisms include at least one of rotational resistance, rigidity, and backlash of a rotation system in each mechanism.

3. The power transmission device according to Claim 2, wherein one of the two internally meshing planetary gear mechanisms is set so as to be lower in rigidity and smaller in backlash than the other mechanism.

4. The power transmission device according to Claim 3, wherein one of the two internally meshing planetary gear mechanisms is

set so as to be higher in rotational resistance, lower in rigidity, and smaller in backlash than the other mechanism.

5. The power transmission device according to Claim 1, wherein a difference in sliding manner is created between corresponding sliding-portions of the two internally meshing planetary gear mechanisms.

6. The power transmission device according to Claim 5, wherein the difference in the sliding manner between the sliding portions of the two internally meshing planetary gear mechanisms is created by providing the sliding portion on one of the mechanisms with a slide-advancing member and not by providing the corresponding sliding portion on the other one with a slide-advancing member.

7. The power transmission device according to Claim 6, wherein each of the two internally meshing planetary gear mechanisms includes an oscillater used to oscillate the external gear, and the difference in the sliding manner between the mechanisms is created by disposing a bearing serving as a slide-advancing member between the oscillater and the external gear on one of the mechanisms and not by disposing a bearing serving as a slide-advancing member at a corresponding place on the other mechanism.

8. The power transmission device according to Claim 6, wherein each of the two internally meshing planetary gear mechanisms includes an inner pin hole formed in the external gear and an

inner pin loosely fitted to the inner pin hole, and the difference in the sliding manner between the mechanisms is created by disposing an inner roller serving as a slide-advancing member on an outer periphery of the inner pin on one of the mechanisms and not by disposing an inner roller serving as a slide-advancing member at a corresponding place on the other mechanism.

9. The power transmission device according to Claim 6, wherein the internal teeth of the internal gears of the two mechanisms are formed by outer pins rotatably disposed in circular arc grooves, and the difference in the sliding manner between the mechanisms is created by disposing outer rollers serving as slide-advancing members on outer peripheries of the outer pins on one of the mechanisms, and not by disposing outer rollers serving as slide-advancing members at corresponding places on the other mechanism.

10. The power transmission device according to Claim 6, wherein the difference in the sliding manner between the mechanisms is created by providing a coating material serving as a slide-advancing member at a sliding portion on one of the mechanisms among corresponding sliding portions of the two internally meshing planetary gear mechanisms, and not by providing a coating material serving as a slide-advancing member at a corresponding sliding portion on the other mechanism.

11. The power transmission device according to Claim 5, wherein the slide-advancing member is disposed at both sliding portions

corresponding to each other of the two internally meshing planetary gear mechanisms, and the difference in the sliding manner between the mechanisms is created by making a difference in kind between the slide-advancing members to be disposed.

12. The power transmission device according to Claim 11, wherein each of the two internally meshing planetary gear mechanisms includes an oscillater used to oscillate the external gear, and a roller or ball bearing serving as a slide-advancing member is disposed between the oscillater and the external gear on one of the mechanisms, and a sliding bearing serving as a slide-advancing member is disposed at a corresponding place on the other mechanism.

13. The power transmission device according to Claim 11, wherein each of the two internally meshing planetary gear mechanisms includes an inner pin hole formed in the external gear and an inner pin loosely fitted to the inner pin hole, and disposed on one of the mechanisms is a first inner roller serving as the slide-advancing member that can come into internal contact with the inner pin hole on an entire outer periphery of the first inner roller, whereas disposed on the other mechanism is a second inner roller serving as the slide-advancing member that can come into internal contact with the inner roller hole on a part of outer periphery of the second inner pin, the outer peripheral surface of the second inner roller being coaxial with an inner peripheral surface of the second inner roller.

14. The power transmission device according to Claim 11, wherein a difference is created in material between the slide-advancing members disposed on the sliding portion of each of the two internally meshing planetary gear mechanisms.

15. The power transmission device according to Claim 5, wherein each of the two internally meshing planetary gear mechanisms includes an oscillater used to oscillate the external gear, and a difference is created in the sliding manner of the sliding portion between the oscillater and the external gear.

16. The power transmission device according to Claim 5, wherein each of the two internally meshing planetary gear mechanisms includes an inner pin hole formed in the external gear and an inner pin loosely fitted to the inner pin hole, and a difference is created in the sliding manner of the sliding portion between the inner pin hole and the inner pin.

17. The power transmission device according to Claim 5, wherein the internal teeth of the internal gear of each of the two internally meshing planetary gear mechanisms are formed by circular arc grooves and outer pins rotatably disposed in the circular arc grooves, and a difference is created in the sliding manner of the sliding portions between the circular arc groove and the outer pin.

18. The power transmission device according to Claim 1, wherein a difference is created in meshing manner between the external teeth of the external gear and the internal teeth of the internal

gear of the two mechanisms.

19. The power transmission device according to Claim 18, wherein a structure of the internal teeth of the internal gear of one of the two mechanisms differs from that of the other mechanism.

20. The power transmission device according to Claim 19, wherein the internal teeth of the internal gear of each of the two mechanisms are formed by outer pins, and the outer pin of one of the two mechanisms has a cylinder, and the outer pin of the other one has a column.

21. The power transmission device according to Claim 19, wherein the internal teeth of the internal gear of each of the two mechanisms are formed by outer pins, and a difference is created in material of the outer pin between the mechanisms.

22. The power transmission device according to Claim 19, wherein the internal teeth of the internal gear of each of the two mechanisms are formed by outer pins, and a difference is created in the outer diameter of the outer pin between the mechanisms.

23. The power transmission device according to Claim 19, wherein the internal teeth of the internal gear of each of the two mechanisms are formed by outer pins, and a difference is created in the holding structure of the outer pin between the mechanisms.

24. The power transmission device according to Claim 18,

wherein a structure of the external teeth of the external gear of one of the two mechanisms differs from that of the other mechanism.

25. The power transmission device according to Claim 24, wherein surface treatment of an external-teeth part of the external gear of one of the two mechanisms differs from that of the other mechanism.

26. The power transmission device according to Claim 24, wherein a tooth profile of the external teeth of the external gear of one of the two mechanisms differs from that of the other mechanism.

27. The power transmission device according to Claim 18, wherein a meshing clearance between the external teeth of the external gear and the internal teeth of the internal gear of one of the two mechanisms differs from that of the other mechanism.

28. The power transmission device according to Claim 27, wherein one of the two internally meshing planetary gear mechanisms is set smaller in the meshing clearance and lower in rigidity than the other mechanism.

29. The power transmission device according to Claim 18, wherein a contact area between the external teeth of the external gear and the internal teeth of the internal gear of one of the two mechanisms differs from that of the other mechanism.

30. The power transmission device according to Claim 29, wherein one of the two internally meshing planetary gear

mechanisms is larger in the contact area and lower in rigidity than the other michanism.

31. The power transmission device according to Claim 1, wherein the external gear of each of the two internally meshing planetary gear mechanisms is supported by an inner pin supported by a same output shaft in a cantilever manner, and supporting rigidity of the external gear of the mechanism disposed on a side of the output shaft is set to be higher than that of the external gear of the mechanism disposed on an opposite side thereof.

32. The power transmission device according to Claim 1, wherein a difference in a difference number of teeth between a number of teeth of the internal gear and a number of teeth of the external gear is created between the two internally meshing planetary gear mechanisms.

33. The power transmission device according to Claim 32, wherein the difference number of one of the two internally meshing planetary gear mechanisms is one, whereas the difference number of the other mechanism is two.

34. The power transmission device according to Claim 1, wherein the number of teeth of the external teeth of the external gear of one of the two mechanisms differs from that of the other mechanism, and a difference in the power transmission characteristics is created by setting the number of teeth of the internal teeth of each mechanism to be equal to the number of teeth by which each mechanism can maintain the same change

gear ratio.

35. The power transmission device according to Claim 34, wherein the internal teeth of the internal gear of each of the two mechanisms are formed based on outer pins the number of which is the same in each mechanism, outer rollers are disposed only at the outer pins that constitute one of the mechanisms, the number of teeth of the internal teeth of the one of the mechanisms is equal to the number of outer pins where the outer rollers are disposed, and the number of teeth of the internal teeth of the other mechanism is equal to the number of all outer pins.

36. The power transmission device according to Claim 35, wherein the outer pins are the same in number and in diameter in each mechanism.

37. The power transmission device according to Claim 1, wherein a difference in the power transmission characteristics is created by making a difference in an amount of eccentricity of an oscillating gear among the internal and external gears of the two internally meshing planetary gear mechanisms.

38. The power transmission device according to Claim 1, wherein a difference in the power transmission characteristics is created by making a difference in material of a part of or all of corresponding members between the two internally meshing planetary gear mechanisms.

39. The power transmission device according to Claim 1, wherein the two internally meshing planetary gear mechanisms have a same

input shaft, a same carrier, a same output shaft, and two kinds of external gears and internal gears, one kind being for one of the mechanisms, the other kind being for the other mechanism, and both kinds being disposed in parallel.

40. The power transmission device according to Claim 1, wherein the two internally meshing planetary gear mechanisms have a same input shaft, a same external gear, a same main body of an internal gear, and two kinds of internal teeth of the same main body of the internal gear, one kind being used for one of the mechanisms, the other kind being used for the other mechanism.

41. The power transmission device according to Claim 40, wherein the internal teeth for one of the mechanisms and the internal teeth for the other mechanism are alternately disposed in a circumferential direction of the same main body of the internal gear.

42. The power transmission device according to Claim 40, wherein the number of teeth of the internal teeth for one of the two mechanisms differs from that of the internal teeth for the other mechanism.

43. The power transmission device according to Claim 1, wherein the two internally meshing planetary gear mechanisms have a same input shaft, a same external gear, a same internal gear, two kinds of inner pin holes formed in the external gear, one kind being used for one of the mechanisms, the other kind being used for the other mechanism, and two kinds of inner pins or inner

rollers constituting a carrier, one kind being used for one of the mechanisms, the other kind being used for the other mechanism.

44. The power transmission device according to Claim 43, wherein the inner pins or the inner rollers for one of the two mechanisms and the inner pins or the inner rollers for the other mechanism are alternately disposed in a circumferential direction.

45. The power transmission device according to Claim 44, wherein the number of the inner pins or the inner rollers for one of the two mechanisms differs from that of the inner pins or the inner rollers for the other mechanism.